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Housing Dynamics over the Business Cycle

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Over the U.S. business cycle, fluctuations in residential investment---i.e., the volume of newly constructed homes---are well known to systematically lead fluctuations in real GDP. Due to this `leading indicator property', new housing construction attracts considerable attention by professional economists. It has been also repeatedly documented that this observation is at odds with the properties of business cycle models once the aggregate capital stock is disaggregated into residential and non-residential.

While the cyclical properties of residential and non-residential investment have been well established for the U.S., little is known about the properties of these data in other countries. Is the U.S. experience unique and data from other countries support the existing theory? The first objective of the paper, therefore, is to provide international evidence on the dynamics of the two types of investment.

The empirical findings can be summarized as follows. In a sample of developed economies, only Canada exhibits the lead in residential investment observed in the U.S. Nonetheless, international data do not support the existing models either; other countries have residential investment coincident with GDP, not lagging as the models predict. Furthermore, in all countries non-residential investment is either lagging or coincident with GDP, not leading as the models predict.

International data on housing starts---the number of housing units whose construction commenced in a given period---make the case against the theory even stronger: nearly all countries in the sample exhibit housing starts strongly leading GDP. Available data on completions, together with the details of national accounting practices, then suggest that the discrepancy between the timing, in relation to output, of housing starts and residential investment occurs due to longer residential time to build in some countries than in the U.S.

An important aspect of housing markets in most developed economies is a reliance of homeowners on mortgage finance to purchase a property. Furthermore, the cyclical dynamics of mortgage rates---and nominal interest rates, both long and short, more generally---are strikingly similar across countries: mortgage rates are negatively correlated with future GDP and positively correlated with past GDP

As a second objective, the paper therefore asks (i) if the dynamics of nominal interest rates observed in the data transmit into similar cyclical variations in the real cost of mortgage finance and if such variations are sufficient to overturn the standard predictions of the theory; and (ii) if time to build in residential investment can then account for the discrepancies between the timing of housing starts and residential investment. To this end, long-term fully-amortizing mortgages and residential time to build are introduced into a business cycle model with home and business sectors.

The real cost of mortgages is summarized in the form of an endogenous time-varying wedge in the Euler equation for residential capital. The wedge, working like a tax/subsidy on residential investment, or like a housing taste shock, depends on expected future real mortgage instalments over the life of the loan, discounted by the household's stochastic discount factor. Thus, unlike observed nominal mortgage rates, the wedge captures the true cost of the mortgage to the household in the model. Its cyclical behaviour, nonetheless, confirms the conjecture drawn from the data. That is, that mortgages are relatively cheap, from households' perspective, ahead of a GDP peak, encouraging residential investment. Consumption smoothing than makes non-residential investment lag output. In a version with multi-period residential time to build, housing starts lead whereas residential investment becomes coincident as in many countries in the sample. The long-term, nominal, fully-amortizing nature of mortgages is crucial in generating these results. The model also predicts that the observed cyclical behaviour of residential investment is not structural in nature and depends on the cyclical dynamics of nominal interest rates and inflation.